PSOCOPTERA OF BARREN GROUNDS NATURE RESERVE, NEW SOUTH WALES

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Abstract

Thirty-nine known species of Psocoptera are recorded and one new species, *Heterocaecilius jordanorum* sp. n., is described from Barren Grounds Nature Reserve, New South Wales. As collecting time was limited and collecting was mainly by beating, the numbers taken suggest that there are many more species to be recorded from the Reserve.

Introduction

Barren Grounds Nature Reserve is about 120 km south from Sydney, inland from Kiama, on one of the southerly plateaus of the Sydney basin. Access is from the Moss Vale to Kiama road. It is about 12 km from Jamberoo and about 17 km from Robertson. Occupying well over 1000 hectares, it is on a sandstone escarpment and supports a variety of vegetation types, including heathland, woodland, higher dense scrub and some tall forest.

Faunal surveys of areas set aside for the preservation and maintenance of biodiversity tend to concentrate on vertebrate animals, this despite the fact that invertebrates make up a considerable proportion of the biomass and form an extremely important part of ecosystems. Such neglect is particularly noticeable where the animals concerned are small, inconspicuous or belong to taxonomically poorly-studied groups, a state of affairs common to many insects groups. One such insect group is the order Psocoptera (psocids or barklice). These feed mainly on microflora, populations are often large and they are important in that they are responsible for making resources tied up in the microflora available to other parts of the food chain.

This paper deals with Psocoptera collected on three brief visits to Barren Grounds Nature Reserve in the 1980s. Visits were made from 12-14 March, 1984 (by C.N. Smithers, A.S. Smithers and B. Duckworth), on 1 March, 1985 (by CNS and ASS) and on 11 and 12 January, 1986 (by G.A. Holloway). On the first occasion 37 species were collected, including one undescribed species. The second collection included seven species, of which two had not been collected previously. On the third visit two species were collected, one of which had not been collected on either of the previous visits. Apart from the brief use of a Malaise trap on 11 and 12 January, 1986, all specimens were collected by beating. In all, 40 species were obtained in fewer than five days collecting. This suggests that collecting at other seasons and using other collecting techniques, such as pit traps, Malaise trap and Berlese funnels, in addition to beating, would reveal the presence of many more species and give a better indication of the true nature of the psocopteran fauna.

To my knowledge, there are no other collections of Psocoptera from Barren Grounds Nature Reserve. The following, therefore, is a list of all species so

far recorded from there and includes a description of the new species. All material is in the Australian Museum, Sydney.

Psocoptera known from Barren Grounds Nature Reserve

CAECILIUSIDAE

Aphyopsocus prolixus Smithers. 1 ♂, 1 nymph, wet sclerophyll, 13.iii.1984.

Maoripsocus concavistigma (Schmidt & Thornton). 1 ♀, *Banksia* woodland, 12.iii.1984.

Maoripsocus dimorphus (Smithers). 1 ♀, 1.iii.1985.

Maoripsocus tugloensis (Smithers). 1 ♂, 3 ♀, wet sclerophyll, 13.iii.1984; 3 ♂, 8 ♀, rain forest, 14.iii.1984.

Maoripsocus wilsoni (Schmidt & Thornton). 1 ♀, 1.iii.1985.

Paracaecilius lemuris Smithers. 4 ♂, 5 ♀, 2 nymphs, wet sclerophyll, 13.iii.1984.

Valenzuela pteridii (Smithers). 1 ♂, *Banksia* woodland, 12.iii.1984; 2 ♀, wet sclerophyll, 13.iii.1984.

AMPHIPSOCIDAE

Taeniostigma trickettae Smithers. 1 ♂, 2 nymphs, rain forest, 14.iii.1984.

ECTOPSOCIDAE

Ectopsocus albiceps Smithers. 1 ♂, 5 ♀, rain forest, 14.iii.1984.

Ectopsocus aldretei Smithers. 1 ♂, rain forest, 14.iii.1984.

Ectopsocus briggsi McLachlan. 8 ♂, 14 ♀, *Banksia* woodland, 12.iii.1984; 1 ♂, rain forest, 14.iii.1984.

Ectopsocus petersi Smithers. 1 ♂, Griffith trail, 13.iii.1984.

Ectopsocus pilosoides Smithers. 1 ♂, 10 ♀, wet sclerophyll, 13.iii.1984.

PERIPSOCIDAE

Peripsocus hamiltonae Smithers. 1 ♂, *Banksia* woodland, 12.iii.1984; 2 ♂, 4 ♀, 1.iii.1985.

Peripsocus maoricus (Tillyard). 13 ♂, 26 ♀, *Banksia* woodland, 12.iii.1984.

Peripsocus milleri (Tillyard). 1 ♂, 1 ♀, *Banksia* woodland, 12.iii.1984; 1 ♂, 1 ♀, Griffith trail, 13.iii.1984.

Peripsocus morulops (Tillyard). 10 ♂, 20 ♀, *Banksia* woodland, 12.iii.1984.

Peripsocus tillyardi New. 1 ♀, wet sclerophyll, 13.iii.1984; 1 ♀, rain forest, 14.iii.1984.

PSEUDOCAECILIIDAE

Austropsocus antennalis Thornton & New. 1 ♂, 13.iii.1984.

Austropsocus omega Thornton & New. 2 ♂, 8 ♀, 4 nymphs, rain forest, 14.iii.1984.

Austropsocus sinuosus (Banks). 1 ♀, Griffith trail, 13.iii.1984.

Austropsocus viridis (Enderlein). 1 ♂, 1 ♀, wet sclerophyll, 13.iii.1984; 1 ♀, rain forest, 14.iii.1984.

Chorocaecilius brunellus (Tillyard). 8 ♂, 4 ♀, 1 nymph, Griffith trail, 13.iii.1984; 4 ♂, 3 ♀, 1.iii.1985.

Cladioneura pulchripennis Enderlein. 1 ♂, 1 ♀, wet sclerophyll, 13.iii.1984.

Heterocaecilius lachlani (Enderlein). 9 ♂, 9 ♀, *Banksia* woodland, 12.iii.1984; 2 ♂, 1.iii.1985.

Heterocaecilius mouldsi Smithers. 1 ♀, rain forest, 14.iii.1984.

Mepleres alettae (Smithers). 2 ♂, 7 ♀ (one brachypterous), 7 nymphs, Nature trail, 13.iii.1984; 2 ♂, 3 ♀, rain forest, 14.iii.1984; 1 ♂, 2 ♀, wet sclerophyll, 13.iii.1984.

Mepleres papillosus (Schmidt & Thornton). 1 ♀, *Banksia* woodland, 12.iii.1984; 2 ♀, wet sclerophyll, 13.iii.1984; 1 ♀, Griffith trail, 13.iii.1984; 1 ♂, rain forest, 14.iii.1984.

Heterocaecilius jordanorum sp. n.

(Figs 1-7)

Types. Holotype ♂, NEW SOUTH WALES: Barren Grounds Nature Reserve, 14.iii.1984, C.N. Smithers, A.S. Smithers, B. Duckworth. *Paratype* ♀, same data as holotype. Both in Australian Museum, Sydney.

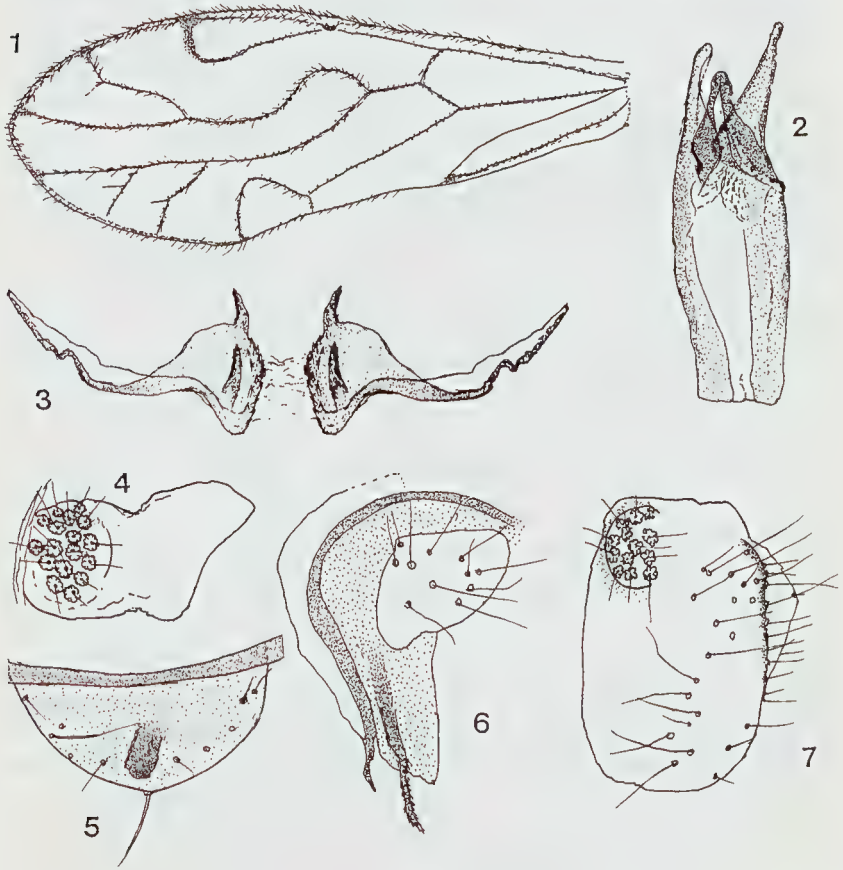
Description: Male: Colouration (in alcohol). Head pale buff with dark brown marks as follows: an elongate, irregularly-shaped spot on each epicranial plate not reaching level of lateral ocelli; a smaller round brown spot on each side at level of ocellar tubercle; an elongate, diffuse pale brown area from ocellar tubercle towards postclypeus; a clearly defined black patch between antenna base and compound eye; a short, diffuse pale brown mark on each side of midline of postclypeus. These marks stand out clearly against the pale background of the front of the head. Genae, labrum and maxillary palps pale. Antennae very pale brown. Eyes black. Ocellar tubercle situated in an irregular black patch. Pronotum pale with irregular lateral dark brown marks. Mesonotum pale brown, a fine brown line along mesial border of lateral lobes and a small black spot anterior to wing base; scutellum pale, dark brown laterally. Metanotum as mesonotum but marks less extensive. Thoracic pleura with irregular, longitudinal dark brown band from behind head to base of abdomen. Legs pale. Forewings (Fig. 1) hyaline with slight brown infuscation at distal ends of main veins and distal end of pterostigma. Abdomen pale with large, conspicuous, irregular black patches on each side of the first three basal segments.

Morphology. Length of body: 2.2 mm. Seen from in front head almost rectangular in outline. Vertex fairly sharp, not broadly rounded. Vertex almost straight and fairly strongly angled laterally above eyes. Three exceptionally large setae arise on vertex, one behind ocellar triangle and one each side from the dark pigment spot. Anterior margin of the postclypeus almost straight. Median epicranial suture fine but distinct; anterior arms evanescent. Epistomial suture absent. Length of flagellar segments: f1: 0.57 mm, f2: 0.45 mm. Eyes large, protruding, not reaching level of vertex. IO/D: 1.8; PO: 0.85. Hind legs not measured (missing from male but female claws have very small preapical tooth on metathoracic legs only; other claws toothless). Forewing length: 2.8 mm; width: 1.0 mm. Pterostigma broadened distally. Costa in pterostigma very strongly thickened, especially at proximal end of pterostigma. R_1 broadened near junction with wing margin. Rs+M fused for as long as basal section of Rs. All veins (except glabrous Cu_2) with more than one row of setae. Wing margin with more than one row except hind margin basad of Cu_{1b}. R_{2+3}, M_2 and M_3 with a short spur vein in both wings of holotype. Rs very strongly sinuous basad of division. In hind wing Rs with a few setae near distal end, R_{2+3}, R_{4+5} and M setose. Veins in basal half of wing glabrous. Some setae of hind margin cross each other, some setae longer than others. Hind margin of tergites 9+10 thickened to form a transverse bar. Epiproct (Fig. 5) with smoothly rounded hind margin, with a short, heavily sclerotized, blunt, median, posteriorly-directed process; glabrous except for irregular submarginal row of strong setae and a very large posteriorly directed marginal seta at midpoint of hind margin. Paraproct (Fig. 4) singularly featureless for a paraproct apart from a large trichobothrial field; paraproct rounded basally, tapering posteriorly. Hypandrium (Fig. 3) largely lightly sclerotized but with a heavily sclerotized posterior band into which are incorporated symmetrically arranged pointed apophyses and spurs. Phallosome (Fig. 2). Parameres extend well beyond the aedeagus. Basally the phallic frame is formed by two long, parallel plates joined only by a membranous connection at the anterior end. Aedeagus simple, the two halves meeting posteriorly at a narrow angle, each broadened basally where they are attached to the parameres. Penial bulb lacks well defined sclerites.

Female. Colouration (in alcohol). As male but markings darker.

Morphology. Length of body: 2.3 mm. Head shape similar to male but lateral angles of vertex a little more rounded and upper margin of vertex a little sinuous. Length of flagellar segments: f1: 0.37 mm; f2: 0.27 mm. Eyes much smaller than in male. IO/D: 2.8; PO: 6.6. Measurements of hind leg: F: 0.2 mm; T: 0.33 mm; t1: 0.063 mm; t2: 0.025 mm; rt: 2.52:1; ct: 15,0. Claws have very small preapical tooth on metathoracic legs only; other claws toothless. Forewing length: 2.6 mm, width: 0.85 mm. Venation and arrangement of setae as in male. Spurveins on veins R_{2+3}, M_2 and M_3 reduced to mere vestiges in positions similar to those of male. Epiproct a simple plate, rounded behind with row of strong setae near anterior margin and a few small

dispersed median setae near hind margin. Paraproct (Fig. 7) lightly sclerotized, ovoid, with strongly developed ridge defining anterior border of trichobothrial field; a band of long, finely pointed setae runs across the paraproct from bottom to top, ending on a shallow dome near the upper end. Subgenital plate simple, with bilobed hind margin, a pair of setae near hind margin of each lobe; curved hind margin very finely spiculate between lobes. Gonapophyses (Fig. 6). Ventral valve with membranous flange, ending in finely spiculate point; dorsal valve broad, rounded distally, with preapical spur which is pointed and spiculate near end; external valve transverse. bearing a setose dome.



Figs 1-7. *Heterocaecilius jordanorum* sp. n. (1-5) male: (1) forewing; (2) phallosome; (3) sclerotisations of hypandrium; (4) paraproct; (5) epiproct. (6-7) female: (6) gonapophyses; (7) paraproct.

Comments. *Heterocaecilius jordanorum* differs from the other four Australian species of the genus *Heterocaecilius* Lee & Thornton in the exaggerated curvature of the radial sector of the forewings, the presence of short spur-veins arising from R_{2+3}, M_2 and M_3 (all more conspicuous in the male than in female), the pattern of dark marks on the front of the head and the bold lateral black patches on either side of the abdomen near its base.

Etymology. This species is named for Pat and Richard Jordan, in recognition of their work and dedication as the first Wardens at Barren Grounds.

PHILOTARSIDAE

Haplophallus sinus Thornton & New. 1 ♂, 8 ♀, *Banksia* woodland, 12.iii.1984; 1 ♂, wet sclerophyll, 13.iii.1984.

Philotarsopsis paraguttata (Thornton & New). 1 ♂, rain forest, 14.iii.1984.

ELIPSOCIDAE

Drymopsocus brunneus Smithers. 1 ♀, rain forest, 14.iii.1984.

Pentacladus eucalypti Enderlein. 2 ♀, *Banksia* woodland, 12.iii.1984; 3 ♂, 5 ♀, 1.iii.1985; 2 ♀, *Banksia* woodland, 11-12.i.1986.

Propsocus pulchripennis (Perkins). 1 ♂, ex malaise trap, 11-12.i.1986.

PSOCIDAE

Blaste taylori New. 1 ♂, *Banksia* woodland, 12.iii.1984.

Blaste tillyardi Smithers. 1 nymph, wet sclerophyll, 13.iii.1984.

Ptycta campbelli Schmidt & Thornton. 13 ♂, 7 ♀, *Banksia* woodland, 12.iii.1984.

Ptycta emarginata New. 1 ♀, *Banksia* woodland, 12.iii.1984.

MYOPSOCIDAE

Myopsocus australis (Brauer). 1 ♀, *Banksia* woodland, 12.iii.1984.

Myopsocus furcatus Smithers. 2 ♀, *Banksia* woodland,, 12.iii.1984; 1 ♀, 1.iii.1985.

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